Small Business Innovation Research/Small Business Tech Transfer

Ultrasonic Additive Manufacturing of Amorphous Alloys, Phase I

Completed Technology Project (2018 - 2019)

Project Introduction

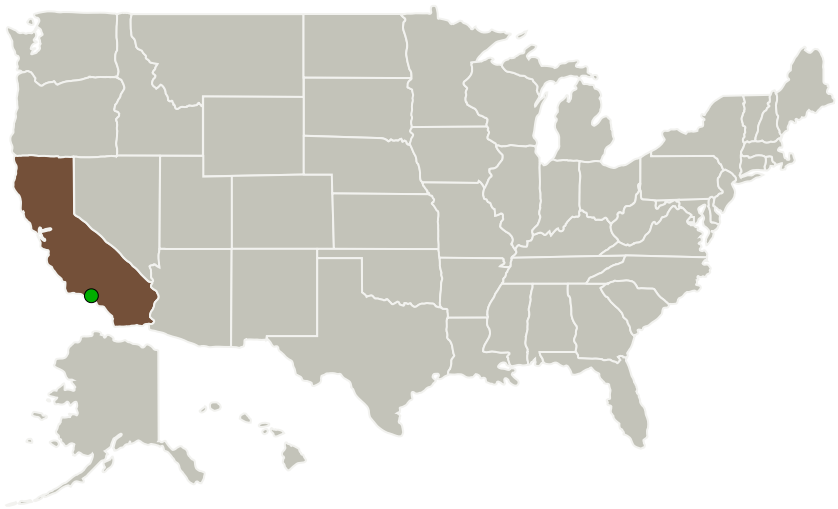
LM Group Holdings Inc. (LMGH) coupled with Fabrisonic Inc. is proposing a program to investigate additive
manufacturing of unique amorphous metal alloys by using the ultrasonic additive manufacturing (UAM)
technology to achieve multifunctional properties that are not possible using conventional manufacturing
processes.

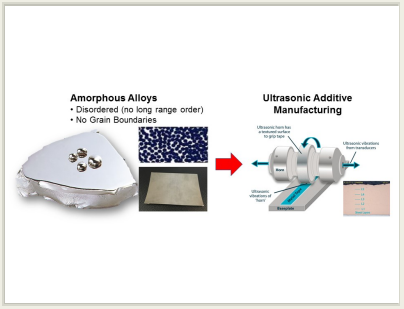
Anticipated Benefits

Fans and compressor section of turbine engines Other engine components (blades, disc, hubs, inlet guide
vanes and cases) Hypersonic vehicles (scramjet inlet flap) Bearings - Impellers Fuel nozzles Gears Struts
Springs Hydraulics systems

Several applications requiring high strength and superior corrosion resistance in energy, desalinization, power, paper, automotive

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
LM Group Holdings, Inc.	Lead Organization	Industry Minority-Owned Business	Lake Forest, California
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations
California

Project Transitions

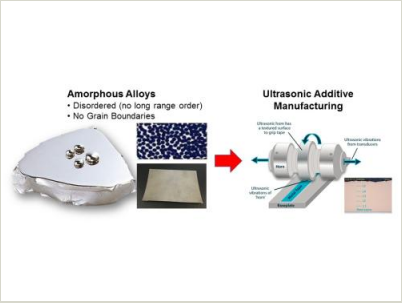
July 2018: Project Start

February 2019: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140126)*

Images



Briefing Chart Image
Ultrasonic Additive Manufacturing of Amorphous Alloys, Phase I *(https://techport.nasa.gov/image/133192)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
LM Group Holdings, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

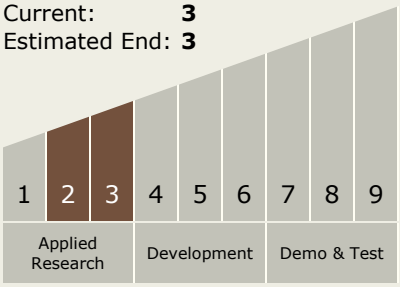
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Evelina Vogli

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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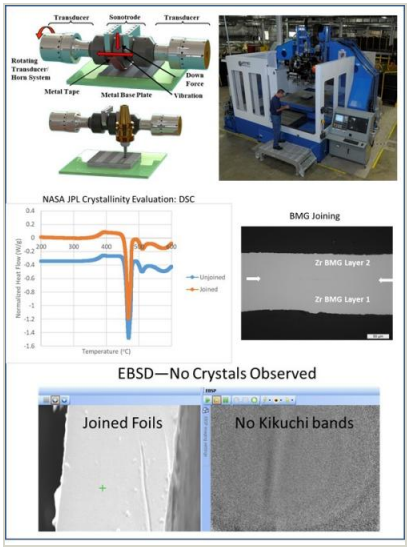
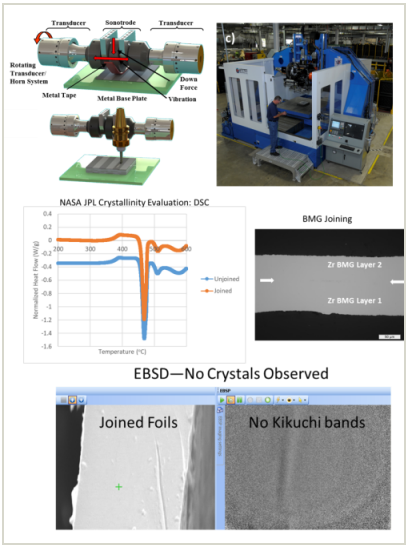


Final Summary Chart Image
Ultrasonic Additive Manufacturing of Amorphous Alloys, Phase I
(https://techport.nasa.gov/image/127639)



Final Summary Chart Image
Ultrasonic Additive Manufacturing of Amorphous Alloys, Phase I
(https://techport.nasa.gov/image/132003)

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.4 Manufacturing
    - TX12.4.1 Manufacturing Processes

Target Destination

Earth